ALCOHOL CONSUMPTION AND ALCOHOL-RELATED PROBLEMS IN GERMANY

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Preface

Alcoholic beverages are consumed by some 90% of the adult population. For many people, alcoholic beverages are a part of their daily lives; alcohol helps people relax after work and is often considered a part of dining. Alcoholic beverages also play an important role in social activity: they are used to celebrate special occasions, facilitate social contact and mark the conclusion of business meetings and political negotiations. Moreover, the alcohol industry is a significant economic factor with regard to employment and tax revenue, given its vast production and distribution structures. It is against this backdrop that we estimate that around 4 million adults (aged 18–59 years) suffer from acute alcohol-related problems (8%) and that around 42,000 people die each year of alcohol-related causes.

Dating back to the beginning of the history of alcohol consumption, there are examples of public and private initiatives aimed at regulating consumption and thereby limiting alcohol's harmful effects. With the exception of a few extreme measures, most of these attempts have not aimed at reducing – and instead often even increased – the positive effects of alcohol consumption (e.g., tax revenue) while simultaneously keeping alcohol-related problems at a minimum. Strategies vary widely across countries and cultures, ranging from the threat of severe punishment in Islamic nations to limiting access (e.g., 1930s prohibition in the United States or current restrictions in Scandinavian countries) to more liberal regulations in Mediterranean countries. Germany is generally viewed as a country with a relatively liberal approach to drinking and a varying level of enforcement of government regulations, for example, with regard to traffic violations or underage drinking.

In recent years, research has produced numerous findings which for the layperson may at first glance seem contradictory. These range from the positive health effects of small amounts of alcohol (as opposed to abstinence) to growing evidence of an increasing number of alcohol-related problems in Germany. Meanwhile, in recent years the medical and research communities have drastically lowered the level of alcohol consumption considered to be low-risk. International guidelines (e.g., WHO, British Medical Association) currently range around 20g of pure alcohol per day for women and 30–40g for men; yet, for certain diseases there is evidence that even consumption below these levels can increase risk.

As more and more research points to the harmful consequences of alcohol consumption, the demand for stricter regulation grows. Tougher regulations must, however, walk a fine line between respecting commercial and individual freedoms for the majority of the population who safely use alcohol and an obligation to protect a minority of persons who are unable to do so. Before a middle ground can be found, it is first necessary to determine as accurately as possible the extent of alcohol consumption and alcohol-related problems in the population; the goal of this report is to help form the necessary basis for doing so. The results and conclusions are the sole re-

sponsibility of the members of the working groups and do not necessarily represent the views of the public authorities, research institutions and associations to which they may belong.

We would like to acknowledge the alcohol industry and its representatives, including Ms. Angelika Wiesgen-Pick (Federal Association of the German Producers and Importers of Spirits – BSI), Mr. Michael Gentsch (DIFA-Forum, a German initiative to encourage the responsible consumption of alcoholic beverages), Mr. Erich Dederichs (German Brewers' Association), Ms. Ursula Schmitt (*Verband Deutscher Sektkellereien e.V.*, a German association of sparkling wine producers) for the productive co-operation and co-ordination on Chapter 2 as well as the resulting recommendation (see Appendix I) for establishing alcohol contents of various alcoholic beverages. This recommendation serves as the basis for a standard conversion of alcohol beverages in grams or litres of pure alcohol, e.g., in relation to individual quantities of consumption per day or the national per capita consumption average. This agreed-upon standard should help prevent the future publication of inconsistent statistics on alcohol use in Germany. In 1997, for example, there were at least nine different estimates of per capita consumption, varying by 20% or approximately two litres (between 9.5 and 11.8 litres). The agreed-upon standards for conversion can serve as a basis for numerous other calculations as well, including comparisons between epidemiological studies, national longitudinal studies of changes in alcohol consumption and cross-country comparisons.

Over a period of two years, the working group collected all relevant information on alcohol-related problems in Germany and, in a process involving six meetings and numerous working phases, collected, analysed and, where insufficient data was available for Germany, estimated the data as accurately as possible. The result is the first comprehensive report on alcohol-related problems in Germany. This report will enable a thorough discussion of harmful consequences with a view to building consensus on possible measures for reducing alcohol-related problems in Germany.

The focus of this report on the negative consequences of alcohol consumption should not be interpreted as overlooking, much less denying, the existence of any positive consequences associated with alcohol consumption. The focus on alcohol-related problems was necessitated by, first, the level of work required and, second, the fact that the German Federal Ministry of Health had already granted an analysis of the positive aspects of alcohol consumption to another party within a special research project. Moreover, the issue of positive effects of consumption has already been researched and the results published by a working group of the head research committee of the German Council on Addiction Problems (*Kuratorium der DHS*) (Seitz, 1999).

For the working group Dr. Gerhard Bühringer

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1 Background and objectives

1.1 Background

Alcohol abuse has been the subject of growing national and international interest for several years, not only in research and public health policy, but also within the media. Though the reasons vary, the following aspects play a key role in the discussion.

Consumption levels and alcohol-related consequences

In recent years, the relationship between alcohol consumption and health has been closely studied and described in some detail. The overview provided by Edwards and around 15 collaborators (Edwards et al., 1994, German translation, 1997), which has been translated into several languages and has received widespread international attention, is perhaps the most prominent publication. This overview demonstrates the correlation between increased alcohol consumption and a range of problems, including alcohol dependence syndrome and related long-term effects, but also a number of consequences – such as somatic diseases (e.g., carcinoma), emotional and family problems (e.g., marital problems and child abuse) and legal problems (e.g., loss of driver's licence for drink driving) – which previously were seldom acknowledged. Edwards' work clearly shows that even relatively low amounts of alcohol can significantly increase risk for both the consumer as well as others (family members, accident victims and insurance companies). Furthermore, it shows that there is a close correlation between the extent of national consumption and overall social costs related to alcohol use.

Guidelines for consumption levels

Various organisations, including the WHO and the British Medical Association, have formulated guidelines for low-risk alcohol consumption. The recommended amounts of on average a maximum of 20 grams of pure alcohol per day for women and 30 grams per day for men are well below what has been recommended in past years and are exceeded by a large portion of the population: in the 1997 German National Survey on Psychoactive Substances (NSPS), the proportion of people consuming on average more than 20 grams (for women) or 30 grams (for men) daily totalled 12.6% (8.8% for women and 16.6% for men). In absolute numbers, this means around 6.1

million people (2.0 million women and 4.1 million men between the ages of 18–59 years).

Alcohol and health

In recent years, the media have focused greater attention on research concerning possible health benefits related to the moderate consumption of alcohol. Though any positive effects of consumption in small amounts versus abstinence appear only at low levels and only when numerous other conditions are met (for a detailed discussion see Edwards et al., 1997, pp. 51–53), the results have nonetheless been widely published in simplified and often falsified form ("red wine powder also protects arteries"; "wine is better than water for liver circulation"; "drinking wine regularly (3–5 glasses per day) greatly reduces the risk of heart and cardiovascular disease and increases life expectancy").

For the layperson, such statements are contradictory and confusing. Yet, even those working in health policy and healthcare have hardly had the opportunity to assess the validity of the information being published and to evaluate its impact.

1.2 Objectives

Alcohol consumption in Germany is of significant economic importance with regard to tax revenue and employment, for example, in terms of production and the hospitality industry. At the same time, alcohol consumption has become much more relevant to public health policy. This is partly due to improved methods of data collection and increased international studies aimed at defining uniform standards and partly due to the fact that the narrowly-defined group of *alcohol dependants* as the central problem group has been expanded to include *alcohol-related problems*. According to various international estimates, some 10–20% of the population is affected; in Germany, this would be between 5.7 and 11.5 million people (in the age group 18–69 years; Edwards et al., 1994).

As Section 1.1 showed, the data must be improved considerably in certain areas before there can be an informed public discussion of alcohol-related problems. This report thus has two main objectives: (1) to develop the best possible *calculation or measurement procedures* for determining the extent of alcohol consumption and related problems in the general population and (2) to obtain the best possible *estimates or calculations* based on the selected procedures. The resulting data should contribute to the creation of a solid empirical foundation for health policy planning in this area. The following are specific goals within this report's main objectives:

- To derive an estimate of the number of consumers and abstainers in the general population according to age, gender and, where possible, socio-economic variables.
- To calculate the average individual level of consumption and form a consensus on the categorisation of users according to quantities of alcohol consumed or the

pattern of alcohol consumption. Thus, per capita consumption of pure alcohol among the entire general population or for specific groups (e.g., according to age and gender) is of particular interest as it can be used as an indicator for international comparisons as well as for trend analyses with regard to long-term developments in Germany. Related to this, uniform standards must replace currently diverse calculation methods for the conversion of alcoholic beverages into quantity of pure alcohol per consumer per year.

- To reach an agreement on the areas of possible alcohol-related problems and estimates of their extent.
- To develop proposals for future research needs as well as for standardising calculations. This should facilitate a comparison of various studies on a national level as well as on European and international levels. To the extent that they are available, European standardisations should be used.

For each of the individual objectives, both the possible measurement procedures and the resulting estimates are to be provided. In the event that either clear calculations or results are not available due to differing procedures and data, then common figures are to be agreed upon through consensus of the expert group.

1.3 Challenges in measuring alcohol-related problems

Before discussing and analysing the data on the status and the development of possible measures, the level of alcohol consumption and alcohol-related problems in the general population should be determined and a consensus should be reached within the scientific community. This is a task which initially appears relatively simple because one can rely, for example, on epidemiological surveys and statistics on incidence of disease. Challenges arise, however, in the details, in particular with regard to the following aspects.

Measuring alcohol consumption and alcohol-related problems

The first problem involves the substantial difficulties in measuring consumption. First, there are differences between questionnaires and approaches to collecting data on various alcohol-related problems. Second, because alcohol abuse is a stigmatised social behaviour, there is a tendency toward underestimating the occurrence of alcohol-related problems. We know, for example, that in Germany self-reports of alcohol consumption, based on representative surveys and projected over the entire population, cover only about one-half of estimates based on production statistics. The extent to which such underreporting is due to denial, forgetting or the point in time of the survey (varying amounts are consumed at various times of the year) cannot be answered at this point. The accurate measurement of alcohol-related problems is complicated by both conscious denial and lacking knowledge of the consequences of alcohol consumption. The fact that in recent years more attention has been paid to the

use of illicit drugs than alcohol undoubtedly also plays a role in keeping the general public less informed about the potential hazards of alcohol use.

Calculation of individual and national consumption levels of pure alcohol

There are various conversion factors for converting alcoholic beverages into individual consumption per day or average annual national per capita consumption of pure alcohol, resulting in differences between the published estimates for Germany of up to 20% or some two litres (see Section 2.2). A standardised conversion method is necessary for the analysis of changes in national consumption over time or in international comparisons.

The relationship between alcohol consumption and negative consequences: the problem of causality

Only in a limited number of cases is the direct causal relationship between alcohol use and its harmful effects clear. Other variables, such as genetic predisposition, lifestyle and other health factors (e.g., smoking, in that high levels of alcohol use are generally associated with frequent smoking) also play a role. Even more difficult is measuring the direct dose-response relationship, given the impact of drinking patterns and other factors in addition to quantity. Not all illnesses or deaths can be entirely attributed to harmful consumption; certain types of cancer, for example, are only partly attributable to alcohol. It is therefore necessary to calculate the correct proportion for each negative consequence (aetiological or alcohol-attributable factors). On the whole, it is necessary to specify causality as precisely as possible.

1.4 Terminology

In order to clearly define the terminology and simplify recurring concepts used in this report, the following section defines a few central concepts.

Alcohol consumption, alcohol consumers, consumers

These broader terms cover the entire range of drinking behaviour, i.e., all persons who use alcohol (including those who already have alcohol-related problems).

Low-risk, hazardous, harmful and high-risk consumption

These concepts describe classes of daily consumption levels of pure alcohol. Details are provided in Section 3.1.

Risk behaviour

This term summarises all consumption patterns and levels which have a high probability of leading to *alcohol-related problems*.

Abusive behaviour

This term summarises all patterns and levels of consumption that have led to *alcohol-related problems*. Abusive behaviour should not be confused with the term *abuse* (a diagnostic category in DSM-IV; see *alcohol-related problems*).

Alcohol-related problems

The term *alcohol-related problems* is used as an overarching concept to describe and summarise all negative consequences of alcohol consumption. It includes three major categories of problems.

Harmful use of alcohol and dependence (dependence syndrome)

These two terms are derived from the International Classifications of Diseases, Version 10 of the World Health Organization (1992; for the German version see Dilling, Mombour and Schmidt, 1999). Some German studies use an alternative diagnostic system, namely DSM (Diagnostic and Statistical Manual), generally Version IV (American Psychiatric Association, 1994; for the German version see Saß et al., 1998). Definitions of harmful use (ICD-10) and alcohol abuse (DSM-IV) vary significantly; the criteria are provided in detail in the Appendix. The ICD classification refers explicitly to physical or mental problems; adverse social consequences are not sufficient for a diagnosis of harmful use. For DSM-IV, on the other hand, social consequences are sufficient indicators of alcohol abuse.

For a diagnosis of alcohol dependence syndrome according to ICD-10, three out of six specified symptoms must be present. The symptoms are based on continued frequent drinking despite obvious or perceived physical and emotional problems. Self-control is limited and in extreme cases, entire behaviour patterns revolve around drinking. The criterion for *harmful use* is that consumption behaviour is physically or psychologically damaging to the health, even though dependence syndrome has not yet developed. The criteria for *abuse* in the DSM diagnostic system are the social consequences of drinking: drinking behaviour plays a more definitive role than health problems, that is, it leads to dangerous situations (e.g., traffic accidents), failure to meet important obligations (e.g., work), legal problems or other social problems that have consistently occurred within a time span of 12 months.

Both classification systems are described in more detail in Appendix II and in Section 4.10.

Alcohol-related diseases

This term refers to all acute and chronic diseases related to alcohol consumption. Examples of acute illnesses are acute alcoholic psychosis or acute intoxication; examples of chronic health consequences are various heart and cardiovascular diseases, various types of carcinomas or fatty liver. This term includes the few diseases which are 100% attributable to alcohol consumption, such as alcoholic hepatitis or gastritis (alcohol attributable fractions, AAF=1) as well as diseases which result to varying degrees from alcohol consumption (AAF<1). Examples are carcinomas or heart and cardiovascular diseases. More information on the concept of alcohol attributable fractions can be found under the heading *Aetiological fraction, alcohol-attributable fraction (AAF)* and in Sections 4.7, 4.11 and 4.12.

Mental and social problems as well as effects on others

The ICD-10 diagnostic system includes *alcohol-related diseases*, *alcohol dependence syndrome*, as well as, within the diagnosis of *harmful use*, mental and social problems which directly impact health. Adverse social consequences such as alcohol-related delinquency (e.g., violence or traffic accidents), family problems (e.g., divorce, financial problems) or work-related problems (e.g., job loss) are not included. Also not included are psychological problems which are not generally believed to directly impact health. These include the effect of destructive parental behaviour on minority-aged children or the impact on intimate relationships. This category also includes effects on others such as children, partners or accident victims as well as society as a whole with regard to decreased tax revenue and increased costs related to disease and criminal activity.

Aetiological fraction, alcohol-attributable fraction (AAF)

These terms are used synonymously to describe the proportion (between AAF=0 and AAF=1) of disease or deaths attributable to alcohol consumption. Very few diseases, such as alcoholic hepatitis, are 100% attributable to alcohol use (AAF=1). Most diseases are only partly caused by alcohol (e.g., cancer of the gullet: AAF=0.75). If the AAFs are not taken into consideration, then the incidence of alcohol-related diseases and deaths is overestimated. If only diseases with an AAF=1 are considered, then incidence is underestimated (further details are available in Sections 4.7, 4.11 and 4.12).

Regional descriptions

The term *western federal states* is used to describe former West Germany (FRG) and the term *eastern federal states* is used to describe the former East Germany (GDR) after unification. Due to space considerations, the tables and diagrams use the terms *West* and *East*.

Abbreviations

Numerous abbreviations are used in the text, for example, for specific surveys, questionnaires or diagnostic systems; these are written out in long form the first time they are used. A list of abbreviations is provided in the Appendices.

1.5 Summary of the working group's tasks

The working group was formed in the autumn of 1997 under the direction of the German Federal Ministry of Health (BMG). Its members are employees of universities and research institutes (Free University of Berlin, IFT Institute for Therapy Research in Munich and the University of Lübeck), associations dealing with alcohol abuse in Germany (German Council on Addiction Problems), as well as state and federal authorities (e.g., the drug commissioner of the German federal state of Thuringia, the Federal Centre for Health Education, and the Robert Koch Institute). Operating as a subordinate body of the BMG, the Robert Koch Institute also conducts independent research. A list of participants is provided in the directory of authors.

The working group met six times between October 1997 and July 1999 to address the following topics (listed here chronologically).

Combining possible areas of alcohol-related problems and existing data sets

This preparatory task was complicated by the lack of necessary data for Germany, which are published in numerous sources or appear only as "grey" literature. Various data sets had to be combined and their individual methodological quality or general validity discussed and evaluated.

Data collection method

While discussing individual studies, it became clear that there were vast differences in data collection methods. The various approaches to measuring weekly or monthly individual consumption levels lead to significant differences. Studies also vary according to time windows (e.g., last week, last month, average consumption during the past year or no time window). Further differences arise from the conversion of alcoholic beverages such as beer or wine into pure alcohol. In 1997, for example, nine different figures were published for per capita consumption of pure alcohol in Germany. These varied by more than two litres (ranging from 9.5 to 11.8 litres), making apparent the need for consensus on specific methodological approaches followed by a partial re-calculation of published survey data.

Forming consensus on methodological guidelines

The working group reached a consensus on the categorisation of consumption amounts. It was necessary, for example, to define abstinence precisely (the definition varies considerably in the international literature with regard to time period and consumption level). In addition, the working group agreed on categories for consumption amounts of pure alcohol per day and described these using standardised abbreviated terms (e.g., low-risk, hazardous, harmful and high-risk consumption).

Much attention was devoted to the conversion of alcoholic beverages into pure alcohol. Because of differences in the available data, numerous discussions were held with representatives from the alcohol industry in order to reach a consensus on the conversion method and the proofs used (alcohol concentration) for individual beverages. This process was time-consuming and added around six months of work – a reasonable amount of time, given that there are several hundred types of alcoholic beverages in each category of beer, wine/sparkling wine and spirits and that each of these have different alcohol concentrations. The problem is that the market proportions are not always known and that in some cases they are regarded as a "company secret." In a very time-consuming and involved process, the working group was able to achieve a consensus with representatives of the National Association of German Spirits Industry Leaders and Importers – BSI (Ms. Wiesgen-Pick), the German Brewers' Association (Mr. Dederichs) and the DIFA-Forum (Mr. Gentsch), in agreement with the *Bundesvereinigung Wein und Spirituosen e.V.* (a German association for wine and spirits) and the *Verband Deutscher Sektkellereien e.V.* (a German association of sparkling wine producers). This agreement sets an important precedent in Europe as it was the first time that such an agreement was reached on a national level. In the future, trend analyses and survey comparisons of consumption levels can be more precise because the basis for conversion can be periodically adjusted to match changing alcohol contents. Improving the basis for comparison requires, however, a uniform approach on the part of all individual countries as the European figures published up to now differ significantly in quality and methodological bases.

Re-calculation of available data

In order to achieve the best possible data basis for combining estimates, data from published studies were re-calculated on the basis of the new consensus guidelines. This made possible the comparison of results of existing studies with regard to commonalities and differences.

Measuring alcohol consumption

Common prevalences for Germany were determined on the basis of re-analyses of various studies. This was done for specific consumer groups (abstainers, low-risk and high-risk-consumers) at the beginning of the working group's co-operation. The extent of the problem was then determined for the most important problem areas.

Where direct national calculations were not available, the best possible estimates were made.

Recommendations for future research

Although a number of studies are available, the report clearly shows that significant research gaps remain. For this reason, each topic area includes a section on recommendations concerning research needs.

1.6 Contributions

The text of the report is the shared responsibility of all authors. Each chapter was written according to individual working group members' research expertise and focus.

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Chapter 3	Consumers and consumption levels	Augustin, Kraus
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2 Production and consumption statistics

2.1 Introduction

There are two basic approaches for determining alcohol consumption in the population: either by directly surveying consumers – i.e., the general population – or by measuring product amounts available for consumption. The first approach yields results according to consumer groups with regard to factors such as gender, age or consumption levels. One drawback to this approach, however, is that, given the "sensitive" nature of questions concerning alcohol consumption, it can result in significant levels of under-reporting.

The second approach, based on product amounts, provides highly accurate figures on average consumption in the population. These figures, however, are not broken down by consumer group. Moreover, factors such as smuggling, cross-border purchasing, duty-free sales, tourist consumption, black market production and sales and private production – the influence of which varies from one country to the next – can lead to inaccuracies.

While a complete breakdown of alcoholic beverages by type – such as beer, wine, sparkling wine and spirits – is useful for evaluating consumption trends, in most cases measurements of aggregate (per capita) consumption are summarised in pure alcohol per annum. This is then typically used for national and international comparisons of consumption levels or for an analysis of developments over time (see Section 2.4).

2.2 Data sources

Statistics on production amounts of alcoholic beverages can be found both in official figures from the German Federal Statistical Office (e.g., Technical series 14 Finances and Taxation) as well as in publications by the German Brewers' Association, the Association of German Wine Producers and the Federal Association of the German Producers and Importers of Spirits (BSI). Production levels alone, however, only serve as a limited indicator of the effects of alcohol consumption on health – the deciding factor is the level of consumption, an estimation of which can be derived from production levels after they have been adjusted for import, export, storage and cross-border activity. A detailed description of this procedure is provided in Appendix III.

Table 1: Per capita consumption of alcoholic beverages and litres of pure alcohol per person

	1991	1997	Difference 1991/1997
Beer	141.9	131.2	–7.6 %
Wine	21.3	18.1	–14.6 %
Sparkling wine	4.7	4.9	+4.3 %
Spirits	7.5	6.1	–18.7 %
Ethanol[1]	12.4	10.8	–12.9 %

[1] Beer 4.8 vol. %, Wine/Sparkling wine 11 vol. %, Spirits 36 vol. % (1991) and 33 vol. % (1997)
Source: ifo-Institute for Economic Research in Munich. Our own calculations

The Munich-based Institute for Economic Research (ifo) calculates consumption levels for beer, wine, sparkling wine and spirits and publishes them at least once annually (ifo express service). These published figures are widely recognised in Germany and are used by all relevant institutions. The consumption figures provided, however, are only for the end product in litres per capita; pure alcohol content is not calculated.

Table 1 shows the figures for the most recent year available – 1997 – compared with the first year on record, 1991. Preliminary figures are available for Germany for 1998: 127.4 litres of beer, 18.1 litres of wine; 4.7 litres of sparkling wine; 6.0 litres of spirits; 10.6 litres of pure alcohol. Because internationally comparable figures are as of yet only available for 1997, this chapter uses only 1997 figures for Germany. In order to calculate the amount of pure alcohol, a specific alcohol content must be determined for each product. For example, one can multiply the per capita consumption of beer at 131.1 litres by 4.8% per volume (vol. %) to arrive at 6.29 litres of pure alcohol per capita for beer. A similar procedure is used for other end products; these figures add up to 10.8 litres of pure alcohol per capita for 1997.

The alcohol content of alcoholic beverages can either be expressed in terms of weight or percent per volume. If alcohol content is expressed by weight, then this figure must be divided by the specific weight (mass) of alcohol in order to arrive at the alcohol content in percent per volume (weight %: 0.794 = vol. %). The reverse procedure can be used for alcohol content by weight by multiplying the alcohol content in percent per volume by the specific weight of alcohol (vol. % x 0.794 = % per weight). It is recommended that the conversion be calculated using the factor 0.794 and that the weight not be rounded off (0.79; 0.8) as this can lead to differences of 0.5% to 1.3%.

Examples for calculating quantities of alcohol in grams

1) *One litre of beer has an alcohol content of 4 % per weight. 4 % per weight means 4 g of alcohol per 100 g beer, or 40 g per 1000 g of beer. In general, one can say that 1000 g beer is roughly equivalent to 1000 ml = 1 litre. A precise conversion indicates a difference of 7 ml, where beer is considered to have a mass of 0.993 g/ml.*